

Estimation of Soil Moisture and Biomass Changes Using SAR Data: Results from MEDA-Spain Experiment

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During the 1991 MAC-EUROPE campaign, the Castilla La-Mancha region of Spain was surveyed by the multi-frequency (P-, L-, C-band) polarimetric AIRSAR of JPL on board the NASA DC-8. The experiment was devised to demonstrate the role of SAR imagery in detecting and estimating surface parameters such as soil moisture and vegetation water content. Two SAR data sets which were acquired almost a month apart (June 19 and July 14, 1991) over Barrax site have been analyzed in conjunction with ground truth data in order to show the sensitivity of each frequency and polarization combinations to variations in surface parameters. It is shown that the C-band HH polarization is more suitable for detecting the changes in crop biomass. However, a combination of frequency and polarization has been used to invert the SAR data in order to estimate the relative changes in soil moisture and vegetation biomass. The results of the inversion technique is in agreement with the observations and ground truth measurements. The SAR derived soil moisture and vegetation biomass are presented in image form.